B

SEQUENCE LISTING

<110> Li, Ming

<120> T-Type Calcium Channel

<130> 004.00191

<140> US 09/383,894
<141> 1999-08-26

<150> US 60/098,004
<151> 1998-08-26

<150> US 60/117,399
<151> 1999-01-27

<160> 16

<170> PatentIn Ver. 2.1

<210> 1
<211> 7129
<212> DNA
<213> Rattus sp.

<400> 1
atggacgagg aggaggatgg agcgggcgcc gaggagtcgg gacagccccg tagcttcacg 60
cagctcaacg acctgtcggg ggccgggggc cggcaggggc cggggtcgac ggaaaaggac 120
ccgggcagcg cggactccga ggcggagggg ctgccgtacc cggcgctagc cccggtggtt 180
ttcttctact tgagccagga cagccgcccg cggagctggt gtctccgcac ggtctgtaac 240
ccgtggttcg agcgagtcag tatgctggtc attcttctca actgtgtgac tctgggtatg 300
ttcaggccgt gtgaggacat tgcctgtgac tcccagcgct gccggatcct gcaggccttc 360
gatgacttca tctttgcctt ctttgctgtg gaaatggtgg tgaagatggt ggccttgggc 420
atctttggga agaaatgtta cctgggagac acttggaacc ggcttgactt tttcattgtc 480
attgcaggga tgctggagta ttcgctggac ctgcagaacg tcagcttctc cgcagtcagg 540
acagtccgtg tgctgcgacc gctcagggcc attaaccggg tgcccagcat gcgcattctc 600
gtcacattac tgctggacac cttgcctatg ctgggcaacg tcctgctgct ctgtttcttc 660
gtctttttca tctttggcat cgtgggcgtc cagctgtggg caggactgct tcgcaaccga 720
tgcttcctcc ccgagaactt cagcctcccc ctgagcgtgg acctggagcc ttattaccag 780
acagagaatg aggacgagag ccgcttcatc tgctctcagc ctcgggagaa tggcatgaga 840
tcctgcagga gtgtgcccac actgcgtggg gaaggcggtg gtggcccacc ctgcagtctg 900
gactatgaga cctataacag ttccagcaac accacctgtg tcaactggaa ccagtactat 960
accaactgct ctgcgggcga gcacaacccc ttcaaaggcg ccatcaactt tgacaacatt 1020
ggctatgcct ggatcgccat cttccaggtc atcacactgg agggctgggt cgacatcatg 1080
tacttcgtaa tggacgctca ctccttctac aacttcatct acttcattct tctcatcatc 1140
gtgggctcct tcttcatgat caacctgtgc ctggtggtga ttgccacgca gttctccgag 1200
accaaacagc gggagagtca gctgatgcgg gagcagcgtg tacgattcct gtccaatgct 1260

agcaccctgg caagcttctc tgagccaggc agctgctatg aggagctact caagtacctg 1320
gtgtacatcc tccgaaaagc agcccgaagg ctggcccagg tctctagggc tataggcgtg 1380
cgggctgggc tgctcagcag cccagtggcc cgtagtgggc aggagcccca gcccagtggc 1440
agctgcactc gctcacaccg tcgtctgtct gtccaccacc tggtccacca ccatcaccac 1500
caccatcacc actaccacct gggtaatggg acgctcagag ttccccgggc cagcccagag 1560
atccaggaca gggatgccaa tgggtctcgc cggctcatgc taccaccacc ctctacaccc 1620
actccctctg ggggccctcc gaggggtgcg gagtctgtac acagcttcta ccatgctgac 1680
tgccacttgg agccagtccg ttgccaggca ccccctccca gatgcccatc ggaggcatct 1740
ggtaggactg tgggtagtgg gaaggtgtac cccactgtgc ataccagccc tccaccagag 1800
atactgaagg ataaagcact agtggaggtg gcccccagcc ctgggccccc caccctcacc 1860
agcttcaaca tcccacctgg gcccttcagc tccatgcaca agctcctgga gacacagagt 1920
acgggagcct gccatagctc ctgcaaaatc tccagccctt gctccaaggc agacagtgga 1980
gcctgcgggc cggacagttg tccctactgt gcccggacag gagcaggaga gccagagtcc 2040
gctgaccatg tcatgcctga ctcagacagc gaggctgtgt atgagttcac acaggacgct 2100
cagcacagtg acctccggga tccccacagc cggcggcgac agcggagcct gggcccagat 2160
gcagagccta gttctgtgct ggctttctgg aggctgatct gtgacacatt ccggaagatc 2220
gtagatagca aatactttgg ccggggaatc atgatcgcca tcctggtcaa tacactcagc 2280
atgggcatcg agtaccacga gcagcccgag gagctcacca acgccctgga aatcagcaac 2340
atcgtcttca ccagcctctt cgccttggag atgctgctga aactgcttgt ctacggtccc 2400
tttggctaca ttaagaatcc ctacaacatc tttgatggtg tcattgtggt catcagtgtg 2460
tgggagattg tgggccagca gggaggtggc ctgtcggtgc tgcggacctt ccgcctgatg 2520
cgggtgctga agctggtgcg cttcctgccg gccctgcagc gccagctcgt ggtgctcatg 2580
aagaccatgg acaacgtggc caccttctgc atgctcctca tgctgttcat cttcatcttc 2640
agcatcctgg gcatgcatct ctttggttgc aagttcgcat ctgaacggga tggggacacg 2700
ttgccagacc ggaagaattt cgactccctg ctctgggcca tcgtcactgt ctttcagatt 2760
ctgactcagg aagactggaa taaagtcctc tacaacggca tggcctccac atcgtcttgg 2820
gctgctcttt acttcatcgc cctcatgact tttggcaact atgtgctctt taacctgctg 2880
gtggccattc ttgtggaagg attccaggca gaggaaatcg gcaaacggga agatgcgagt 2940
ggacagttaa gctgtattca gctgcctgtc aactctcagg ggggagatgc caccaagtct 3000
gagtcagagc ctgatttctt ttcgcccagt gtggatggtg atggggacag aaagaagcgc 3060
ttggccctgg tggctttggg agaacacgcg gaactacgaa agagcctttt gccacccctc 3120
atcatccata cggctgcgac accaatgtca ctacccaaga gctccagcac aggtgtgggg 3180
gaagcactgg gctctggctc tcgacgtacc agtagcagtg ggtccgctga gcctggagct 3240
gcccaccatg agatgaaatc tccgccaagt gcccgcagct ccccgcacag tccctggagt 3300
gcggcaagca gctggaccag caggcgctcc agcaggaaca gcctgggccg ggcccccagc 3360
ctaaagcgga ggagcccgag cggggagcgg aggtccctgc tgtctggaga gggccaggag 3420
agtcaggatg aggaggaaag ttcagaagag gaccgggcca gcccagcagg cagtgaccat 3480
cgccacaggg gttccttgga acgtgaggcc aagagttcct ttgacctgcc tgacactctg 3540
caggtgccgg ggctgcaccg cacagccagc ggccggagct ctgcctctga gcaccaagac 3600
tgtaatggca agtcggcttc agggcgtttg gcccgcaccc tgaggactga tgaccccaa 3660
ctggatgggg atgatgacaa tgatgaggga aatctgagca aaggggaacg catacaagcc 3720
tgggtcagat cccggcttcc tgcctgttgc cgagagcgag attcctggtc ggcctatatc 3780
tttcctcctc agtcaaggtt tcgtctcctg tgtcaccgga tcatcaccca caagatgttt 3840
gaccatgtgg tcctcgtcat catcttcctc aactgtatca ccatcgctat ggagcgcccc 3900
aaaattgacc cccacagcgc tgagcgcatc ttcctgaccc tctccaacta catcttcacg 3960
gcagtctttc tagctgaaat gacagtgaag gtggtggcac tgggctggtg ctttggggag 4020
caggcctacc tgcgcagcag ctggaatgtg ctggacggct tgctggtgct catctccgtc 4080
atcgacatcc tggtctccat ggtctccgac agcggcacca agatccttgg catgctgagg 4140

gtgctgcggc tgctgcggac cctgcgtcca ctcagggtca tcagccgggc ccagggactg 4200
aagctggtgg tagagactct gatgtcatcc ctcaaaccca ttggcaacat tgtggtcatt 4260
tgctgtgcct tcttcatcat ttttggaatt ctcggggtgc agctcttcaa agggaagttc 4320
ttcgtgtgtc agggtgagga caccaggaac atcactaaca aatccgactg cgctgaggcc 4380
agctaccgat gggtccggca caagtacaac tttgacaacc tgggccaggc tctgatgtcc 4440
ctgtttgtgc tggcctccaa ggatggttgg gttgacatca tgtatgatgg gctggatgct 4500
gtgggtgtgg atcagcagcc catcatgaac cacaacccct ggatgctgct atacttcatc 4560
tccttcctcc tcatcgtggc cttctttgtc ctgaacatgt ttgtgggcgt ggtggtggag 4620
aacttccata agtgcagaca gcaccaggag gaggaggagg cgaggcggcg tgaggagaag 4680
cgactacgga ggctggagaa aaagagaagg aatctaatgt tggacgatgt aattgcttcc 4740
ggcagctcag ccagcgctgc gtcagaagcc cagtgcaagc cctactactc tgactactcg 4800
agattccggc tccttgtcca ccacctgtgt accagccact acctggacct cttcatcact 4860
ggtgtcatcg ggctgaacgt ggtcactatg gccatggaac attaccagca gccccagatc 4920
ctggacgagg ctctgaagat ctgcaattac atctttaccg tcatctttgt ctttgagtca 4980
gttttcaaac ttgtggcctt tggcttccgc cgtttcttcc aggacaggtg gaaccagctg 5040
gacctggcta ttgtgcttct gtccatcatg ggcatcacac tggaggagat tgaggtcaat 5100
gcttcgctgc ccatcaaccc caccatcatc cgtatcatga gggtgctccg cattgctcga 5160
gttctgaagc tgttgaagat ggctgtgggc atgcgggcac tgctggacac ggtgatgcag 5220
gccctgcccc aggtggggaa cctgggactt ctcttcatgt tattgttttt catctttgca 5280
gctctgggcg tggagctctt tggagacctg gagtgtgatg agacacaccc ttgtgagggc 5340
ttgggtcggc atgccacctt taggaacttt ggtatggcct ttctgaccct cttccgagtc 5400
tccactggtg acaactggaa tggtattatg aaggacaccc tccgggactg tgaccaggag 5460
tccacctgct acaacactgt catctccccc atctactttg tgtccttcgt gctgacggcc 5520
cagtttgtgc tggtcaacgt ggtcatagct gtgctgatga agcacctgga agaaagcaac 5580
aaagaggcca aggaggaggc cgagctcgag gccgagctgg agctggagat gaagacgctc 5640
agcccgcagc cccactcccc gctgggcagc cccttcctct ggcccggggt ggagggtgtc 5700
aacagtcctg acagccctaa gcctggggct ccacacacca ctgcccacat tggagcagcc 5760
tcgggcttct cccttgagca ccccacgatg gtaccccacc ccgaggaggt gccagtcccc 5820
ctaggaccag acctgctgac tgtgaggaag tctggtgtca gccggacgca ctctctgccc 5880
aatgacagct acatgtgccg caatgggagc actgctgaga gatccctagg acacaggggc 5940
tgggggctcc ccaaagccca gtcaggctcc atcttgtccg ttcactccca accagcagac 6000
accagctgca tcctacagct tcccaaagat gtgcactatc tgctccagcc tcatggggcc 6060
cccacctggg gcgccatccc taaactaccc ccacctggcc gctcccctct ggctcagagg 6120
cctctcaggc gccaggcagc aataaggact gactccctgg atgtgcaggg cctgggtagc 6180
cgggaagacc tgttgtcaga ggtgagtggg ccctcctgcc ctctgacccg gtcctcatcc 6240
ttctggggcg ggtcgagcat ccaggtgcag cagcgttccg gcatccagag caaagtctcc 6300
aagcacatcc gcctgccagc cccttgccca ggcctggaac ccagctgggc caaggaccct 6360
ccagagacca gaagcagctt agagctggac acggagctga gctggatttc aggagacctc 6420
cttcccagca gccaggaaga acccctgtcc ccacgggacc tgaagaagtg ctacagtgta 6480
gagacccaga gctgcaggcg caggcctggg tcctggctag atgaacagcg gagacactcc 6540
attgctgtca gctgtctgga cagcggctcc caaccccgcc tatgtccaag cccctcaagc 6600
ctcgggggcc aacctcttgg gggtcctggg agccggccta agaaaaaact cagcccaccc 6660
agtatctcta tagacccccc ggagagccag ggctctcggc ccccatgcag tcctggtgtc 6720
tgcctcagga ggagggcgcc ggccagtgac tctaaggatc cctcggtctc cagccccctt 6780
gacagcacgg ctgcctcacc ctccccaaag aaagacacgc tgagtctctc tggtttgtct 6840
tctgacccaa cagacatgga cccctgagtc ctacccactc tcccccatca cctttctcca 6900
ccgggtgcag atcctagctc cgcctcctgg gcagcgtttc tgaaaagtcc cacgtaagca 6960
gcaagcagcc acgaggcacc tcacctgcct tcttcagtgg ctggtgggga tgacgagcag 7020

aacttccgga gagtcgatct gaagagaaca cagccctgga gcccctgcct ccgggaagaa 7080
ggaaaaggag aaagcccagt gtggccaagg ctcccgacac caggagctg 7129

<210> 2
<211> 2374
<212> PRT
<213> Rattus sp.

<400> 2
Met Asp Glu Glu Glu Asp Gly Ala Gly Ala Glu Glu Ser Gly Gln Pro
1 5 10 15

Arg Ser Phe Thr Gln Leu Asn Asp Leu Ser Gly Ala Gly Gly Arg Gln
20 25 30

Gly Pro Gly Ser Thr Glu Lys Asp Pro Gly Ser Ala Asp Ser Glu Ala
35 40 45

Glu Gly Leu Pro Tyr Pro Ala Leu Ala Pro Val Val Phe Phe Tyr Leu
50 55 60

Ser Gln Asp Ser Arg Pro Arg Ser Trp Cys Leu Arg Thr Val Cys Asn
65 70 75 80

Pro Trp Phe Glu Arg Val Ser Met Leu Val Ile Leu Leu Asn Cys Val
85 90 95

Thr Leu Gly Met Phe Arg Pro Cys Glu Asp Ile Ala Cys Asp Ser Gln
100 105 110

Arg Cys Arg Ile Leu Gln Ala Phe Asp Asp Phe Ile Phe Ala Phe Phe
115 120 125

Ala Val Glu Met Val Val Lys Met Val Ala Leu Gly Ile Phe Gly Lys
130 135 140

Lys Cys Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe Phe Ile Val
145 150 155 160

Ile Ala Gly Met Leu Glu Tyr Ser Leu Asp Leu Gln Asn Val Ser Phe
165 170 175

Ser Ala Val Arg Thr Val Arg Val Leu Arg Pro Leu Arg Ala Ile Asn
180 185 190

Arg Val Pro Ser Met Arg Ile Leu Val Thr Leu Leu Leu Asp Thr Leu
195 200 205

Pro Met Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile
210 215 220

Phe Gly Ile Val Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg
225 230 235 240

Cys Phe Leu Pro Glu Asn Phe Ser Leu Pro Leu Ser Val Asp Leu Glu
245 250 255

Pro Tyr Tyr Gln Thr Glu Asn Glu Asp Glu Ser Pro Phe Ile Cys Ser
260 265 270

Gln Pro Arg Glu Asn Gly Met Arg Ser Cys Arg Ser Val Pro Thr Leu
275 280 285

Arg Gly Glu Gly Gly Gly Gly Pro Pro Cys Ser Leu Asp Tyr Glu Thr
290 295 300

Tyr Asn Ser Ser Ser Asn Thr Thr Cys Val Asn Trp Asn Gln Tyr Tyr
305 310 315 320

Thr Asn Cys Ser Ala Gly Glu His Asn Pro Phe Lys Gly Ala Ile Asn
325 330 335

Phe Asp Asn Ile Gly Tyr Ala Trp Ile Ala Ile Phe Gln Val Ile Thr
340 345 350

Leu Glu Gly Trp Val Asp Ile Met Tyr Phe Val Met Asp Ala His Ser
355 360 365

Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile Val Gly Ser Phe
370 375 380

Phe Met Ile Asn Leu Cys Leu Val Val Ile Ala Thr Gln Phe Ser Glu
385 390 395 400

Thr Lys Gln Arg Glu Ser Gln Leu Met Arg Glu Gln Arg Val Arg Phe
405 410 415

Leu Ser Asn Ala Ser Thr Leu Ala Ser Phe Ser Glu Pro Gly Ser Cys
420 425 430

Tyr Glu Glu Leu Leu Lys Tyr Leu Val Tyr Ile Leu Arg Lys Ala Ala
435 440 445

Arg Arg Leu Ala Gln Val Ser Arg Ala Ile Gly Val Arg Ala Gly Leu
450 455 460

Leu Ser Ser Pro Val Ala Arg Ser Gly Gln Glu Pro Gln Pro Ser Gly
465 470 475 480

Ser Cys Thr Arg Ser His Arg Arg Leu Ser Val His His Leu Val His
485 490 495

His His His His His His His His Tyr His Leu Gly Asn Gly Thr Leu
500 505 510

Arg Val Pro Arg Ala Ser Pro Glu Ile Gln Asp Arg Asp Ala Asn Gly
515 520 525

Ser Arg Arg Leu Met Leu Pro Pro Pro Ser Thr Pro Thr Pro Ser Gly
530 535 540

Gly Pro Pro Arg Gly Ala Glu Ser Val His Ser Phe Tyr His Ala Asp
545 550 555 560

Cys His Leu Glu Pro Val Arg Cys Gln Ala Pro Pro Pro Arg Cys Pro
565 570 575

Ser Glu Ala Ser Gly Arg Thr Val Gly Ser Gly Lys Val Tyr Pro Thr
580 585 590

Val His Thr Ser Pro Pro Pro Glu Ile Leu Lys Asp Lys Ala Leu Val
595 600 605

Glu Val Ala Pro Ser Pro Gly Pro Pro Thr Leu Thr Ser Phe Asn Ile
610 615 620

Pro Pro Gly Pro Phe Ser Ser Met His Lys Leu Leu Glu Thr Gln Ser
625 630 635 640

Thr Gly Ala Cys His Ser Ser Cys Lys Ile Ser Ser Pro Cys Ser Lys
645 650 655

Ala Asp Ser Gly Ala Cys Gly Pro Asp Ser Cys Pro Tyr Cys Ala Arg
660 665 670

Thr Gly Ala Gly Glu Pro Glu Ser Ala Asp His Val Met Pro Asp Ser
675 680 685

Asp Ser Glu Ala Val Tyr Glu Phe Thr Gln Asp Ala Gln His Ser Asp
690 695 700

Leu Arg Asp Pro His Ser Arg Arg Arg Gln Arg Ser Leu Gly Pro Asp
705 710 715 720

Ala Glu Pro Ser Ser Val Leu Ala Phe Trp Arg Leu Ile Cys Asp Thr
725 730 735

Phe Arg Lys Ile Val Asp Ser Lys Tyr Phe Gly Arg Gly Ile Met Ile
740 745 750

Ala Ile Leu Val Asn Thr Leu Ser Met Gly Ile Glu Tyr His Glu Gln
755 760 765

Pro Glu Glu Leu Thr Asn Ala Leu Glu Ile Ser Asn Ile Val Phe Thr
770 775 780

Ser Leu Phe Ala Leu Glu Met Leu Leu Lys Leu Leu Val Tyr Gly Pro
785 790 795 800

Phe Gly Tyr Ile Lys Asn Pro Tyr Asn Ile Phe Asp Gly Val Ile Val
805 810 815

Val Ile Ser Val Trp Glu Ile Val Gly Gln Gln Gly Gly Gly Leu Ser
820 825 830

Val Leu Arg Thr Phe Arg Leu Met Arg Val Leu Lys Leu Val Arg Phe
835 840 845

Leu Pro Ala Leu Gln Arg Gln Leu Val Val Leu Met Lys Thr Met Asp
850 855 860

Asn Val Ala Thr Phe Cys Met Leu Leu Met Leu Phe Ile Phe Ile Phe
865 870 875 880

Ser Ile Leu Gly Met His Leu Phe Gly Cys Lys Phe Ala Ser Glu Arg
885 890 895

Asp Gly Asp Thr Leu Pro Asp Arg Lys Asn Phe Asp Ser Leu Leu Trp
900 905 910

Ala Ile Val Thr Val Phe Gln Ile Leu Thr Gln Glu Asp Trp Asn Lys
915 920 925

Val Leu Tyr Asn Gly Met Ala Ser Thr Ser Ser Trp Ala Ala Leu Tyr
930 935 940

Phe Ile Ala Leu Met Thr Phe Gly Asn Tyr Val Leu Phe Asn Leu Leu
945 950 955 960

Val Ala Ile Leu Val Glu Gly Phe Gln Ala Glu Glu Ile Gly Lys Arg
965 970 975

Glu Asp Ala Ser Gly Gln Leu Ser Cys Ile Gln Leu Pro Val Asn Ser
980 985 990

Gln Gly Gly Asp Ala Thr Lys Ser Glu Ser Glu Pro Asp Phe Phe Ser
995 1000 1005

Pro Ser Val Asp Gly Asp Gly Asp Arg Lys Lys Arg Leu Ala Leu Val
1010 1015 1020

Ala Leu Gly Glu His Ala Glu Leu Arg Lys Ser Leu Leu Pro Pro Leu
1025 1030 1035 1040

Ile Ile His Thr Ala Ala Thr Pro Met Ser Leu Pro Lys Ser Ser Ser
1045 1050 1055

Thr Gly Val Gly Glu Ala Leu Gly Ser Gly Ser Arg Arg Thr Ser Ser
1060 1065 1070

Ser Gly Ser Ala Glu Pro Gly Ala Ala His His Glu Met Lys Ser Pro
1075 1080 1085

Pro Ser Ala Arg Ser Ser Pro His Ser Pro Trp Ser Ala Ala Ser Ser
1090 1095 1100

Trp Thr Ser Arg Arg Ser Ser Arg Asn Ser Leu Gly Arg Ala Pro Ser
1105 1110 1115 1120

Leu Lys Arg Arg Ser Pro Ser Gly Glu Arg Arg Ser Leu Leu Ser Gly
1125 1130 1135

Glu Gly Gln Glu Ser Gln Asp Glu Glu Glu Ser Ser Glu Glu Asp Arg
1140 1145 1150

Ala Ser Pro Ala Gly Ser Asp His Arg His Arg Gly Ser Leu Glu Arg
1155 1160 1165

Glu Ala Lys Ser Ser Phe Asp Leu Pro Asp Thr Leu Gln Val Pro Gly
1170 1175 1180

Leu His Arg Thr Ala Ser Gly Arg Ser Ser Ala Ser Glu His Gln Asp
1185 1190 1195 1200

Cys Asn Gly Lys Ser Ala Ser Gly Arg Leu Ala Arg Thr Leu Arg Thr
1205 1210 1215

Asp Asp Pro Gln Leu Asp Gly Asp Asp Asp Asn Asp Glu Gly Asn Leu
1220 1225 1230

Ser Lys Gly Glu Arg Ile Gln Ala Trp Val Arg Ser Arg Leu Pro Ala
1235 1240 1245

Cys Cys Arg Glu Arg Asp Ser Trp Ser Ala Tyr Ile Phe Pro Pro Gln
1250 1255 1260

Ser Arg Phe Arg Leu Leu Cys His Arg Ile Ile Thr His Lys Met Phe
1265 1270 1275 1280

Asp His Val Val Leu Val Ile Ile Phe Leu Asn Cys Ile Thr Ile Ala
1285 1290 1295

Met Glu Arg Pro Lys Ile Asp Pro His Ser Ala Glu Arg Ile Phe Leu
1300 1305 1310

Thr Leu Ser Asn Tyr Ile Phe Thr Ala Val Phe Leu Ala Glu Met Thr
1315 1320 1325

Val Lys Val Val Ala Leu Gly Trp Cys Phe Gly Glu Gln Ala Tyr Leu
1330 1335 1340

Arg Ser Ser Trp Asn Val Leu Asp Gly Leu Leu Val Leu Ile Ser Val
1345 1350 1355 1360

Ile Asp Ile Leu Val Ser Met Val Ser Asp Ser Gly Thr Lys Ile Leu
1365 1370 1375

Gly Met Leu Arg Val Leu Arg Leu Leu Arg Thr Leu Arg Pro Leu Arg
1380 1385 1390

Val Ile Ser Arg Ala Gln Gly Leu Lys Leu Val Val Glu Thr Leu Met
1395 1400 1405

Ser Ser Leu Lys Pro Ile Gly Asn Ile Val Val Ile Cys Cys Ala Phe
1410 1415 1420

Phe Ile Ile Phe Gly Ile Leu Gly Val Gln Leu Phe Lys Gly Lys Phe
1425 1430 1435 1440

Phe Val Cys Gln Gly Glu Asp Thr Arg Asn Ile Thr Asn Lys Ser Asp
1445 1450 1455

Cys Ala Glu Ala Ser Tyr Arg Trp Val Arg His Lys Tyr Asn Phe Asp
1460 1465 1470

Asn Leu Gly Gln Ala Leu Met Ser Leu Phe Val Leu Ala Ser Lys Asp
1475 1480 1485

Gly Trp Val Asp Ile Met Tyr Asp Gly Leu Asp Ala Val Gly Val Asp
1490 1495 1500

Gln Gln Pro Ile Met Asn His Asn Pro Trp Met Leu Leu Tyr Phe Ile
1505 1510 1515 1520

Ser Phe Leu Leu Ile Val Ala Phe Phe Val Leu Asn Met Phe Val Gly
1525 1530 1535

Val Val Val Glu Asn Phe His Lys Cys Arg Gln His Gln Glu Glu Glu
1540 1545 1550

Glu Ala Arg Arg Arg Glu Glu Lys Arg Leu Arg Arg Leu Glu Lys Lys
1555 1560 1565

Arg Arg Asn Leu Met Leu Asp Asp Val Ile Ala Ser Gly Ser Ser Ala
1570 1575 1580

Ser Ala Ala Ser Glu Ala Gln Cys Lys Pro Tyr Tyr Ser Asp Tyr Ser
1585 1590 1595 1600

Arg Phe Arg Leu Leu Val His His Leu Cys Thr Ser His Tyr Leu Asp
1605 1610 1615

Leu Phe Ile Thr Gly Val Ile Gly Leu Asn Val Val Thr Met Ala Met
1620 1625 1630

Glu His Tyr Gln Gln Pro Gln Ile Leu Asp Glu Ala Leu Lys Ile Cys
1635 1640 1645

Asn Tyr Ile Phe Thr Val Ile Phe Val Phe Glu Ser Val Phe Lys Leu
1650 1655 1660

Val Ala Phe Gly Phe Arg Arg Phe Phe Gln Asp Arg Trp Asn Gln Leu
1665 1670 1675 1680

Asp Leu Ala Ile Val Leu Leu Ser Ile Met Gly Ile Thr Leu Glu Glu
1685 1690 1695

Ile Glu Val Asn Ala Ser Leu Pro Ile Asn Pro Thr Ile Ile Arg Ile
1700 1705 1710

Met Arg Val Leu Arg Ile Ala Arg Val Leu Lys Leu Leu Lys Met Ala
1715 1720 1725

Val Gly Met Arg Ala Leu Leu Asp Thr Val Met Gln Ala Leu Pro Gln
1730 1735 1740

Val Gly Asn Leu Gly Leu Leu Phe Met Leu Leu Phe Phe Ile Phe Ala
1745 1750 1755 1760

Ala Leu Gly Val Glu Leu Phe Gly Asp Leu Glu Cys Asp Glu Thr His
1765 1770 1775

Pro Cys Glu Gly Leu Gly Arg His Ala Thr Phe Arg Asn Phe Gly Met
1780 1785 1790

Ala Phe Leu Thr Leu Phe Arg Val Ser Thr Gly Asp Asn Trp Asn Gly
1795 1800 1805

Ile Met Lys Asp Thr Leu Arg Asp Cys Asp Gln Glu Ser Thr Cys Tyr
1810 1815 1820

Asn Thr Val Ile Ser Pro Ile Tyr Phe Val Ser Phe Val Leu Thr Ala
1825 1830 1835 1840

Gln Phe Val Leu Val Asn Val Val Ile Ala Val Leu Met Lys His Leu
1845 1850 1855

Glu Glu Ser Asn Lys Glu Ala Lys Glu Glu Ala Glu Leu Glu Ala Glu
1860 1865 1870

Leu Glu Leu Glu Met Lys Thr Leu Ser Pro Gln Pro His Ser Pro Leu
1875 1880 1885

Gly Ser Pro Phe Leu Trp Pro Gly Val Glu Gly Val Asn Ser Pro Asp
1890 1895 1900

Ser Pro Lys Pro Gly Ala Pro His Thr Thr Ala His Ile Gly Ala Ala
1905 1910 1915 1920

Ser Gly Phe Ser Leu Glu His Pro Thr Met Val Pro His Pro Glu Glu
1925 1930 1935

Val Pro Val Pro Leu Gly Pro Asp Leu Leu Thr Val Arg Lys Ser Gly
1940 1945 1950

Val Ser Arg Thr His Ser Leu Pro Asn Asp Ser Tyr Met Cys Arg Asn
1955 1960 1965

Gly Ser Thr Ala Glu Arg Ser Leu Gly His Arg Gly Trp Gly Leu Pro
1970 1975 1980

Lys Ala Gln Ser Gly Ser Ile Leu Ser Val His Ser Gln Pro Ala Asp
1985 1990 1995 2000

Thr Ser Cys Ile Leu Gln Leu Pro Lys Asp Val His Tyr Leu Leu Gln
2005 2010 2015

Pro His Gly Ala Pro Thr Trp Gly Ala Ile Pro Lys Leu Pro Pro Pro
2020 2025 2030

Gly Arg Ser Pro Leu Ala Gln Arg Pro Leu Arg Arg Gln Ala Ala Ile
2035 2040 2045

Arg Thr Asp Ser Leu Asp Val Gln Gly Leu Gly Ser Arg Glu Asp Leu
2050 2055 2060

Leu Ser Glu Val Ser Gly Pro Ser Cys Pro Leu Thr Arg Ser Ser Ser
2065 2070 2075 2080

Phe Trp Gly Gly Ser Ser Ile Gln Val Gln Gln Arg Ser Gly Ile Gln
2085 2090 2095

Ser Lys Val Ser Lys His Ile Arg Leu Pro Ala Pro Cys Pro Gly Leu
2100 2105 2110

Glu Pro Ser Trp Ala Lys Asp Pro Pro Glu Thr Arg Ser Ser Leu Glu
2115 2120 2125

Leu Asp Thr Glu Leu Ser Trp Ile Ser Gly Asp Leu Leu Pro Ser Ser
2130 2135 2140

Gln Glu Glu Pro Leu Ser Pro Arg Asp Leu Lys Lys Cys Tyr Ser Val
2145 2150 2155 2160

Glu Thr Gln Ser Cys Arg Arg Arg Pro Gly Ser Trp Leu Asp Glu Gln
2165 2170 2175

Arg Arg His Ser Ile Ala Val Ser Cys Leu Asp Ser Gly Ser Gln Pro
2180 2185 2190

Arg Leu Cys Pro Ser Pro Ser Ser Leu Gly Gly Gln Pro Leu Gly Gly
2195 2200 2205

Pro Gly Ser Arg Pro Lys Lys Lys Leu Ser Pro Pro Ser Ile Ser Ile
2210 2215 2220

Asp Pro Pro Glu Ser Gln Gly Ser Arg Pro Pro Cys Ser Pro Gly Val
2225 2230 2235 2240

Cys Leu Arg Arg Arg Ala Pro Ala Ser Asp Ser Lys Asp Pro Ser Val
2245 2250 2255

Ser Ser Pro Leu Asp Ser Thr Ala Ala Ser Pro Ser Pro Lys Lys Asp
2260 2265 2270

Thr Leu Ser Leu Ser Gly Leu Ser Ser Asp Pro Thr Asp Met Asp Pro
2275 2280 2285

Val Leu Pro Thr Leu Pro His His Leu Ser Pro Pro Gly Ala Asp Pro
2290 2295 2300

Ser Ser Ala Ser Trp Ala Ala Phe Leu Lys Ser Pro Thr Ala Ala Ser
2305 2310 2315 2320

Ser His Glu Ala Pro His Leu Pro Ser Ser Val Ala Gly Gly Asp Asp
2325 2330 2335

Glu Gln Asn Phe Arg Arg Val Asp Leu Lys Arg Thr Gln Pro Trp Ser
2340 2345 2350

Pro Cys Leu Arg Glu Glu Gly Lys Gly Glu Ser Pro Val Trp Pro Arg
2355 2360 2365

Leu Pro Thr Pro Gly Ala
2370

<210> 3
<211> 7285
<212> DNA
<213> Rattus sp.

<400> 3
gagctgagct gaactggccc tcctggggac tcagcaagct ctctagagcc ccccacatgc 60
tcccccaccg gggtcccccg gttgcgtgag gacacctcct ctgaggggct ccgctcgccc 120
ctcttcggac cccccggggc cccggctggc cagaggatgg acgaggagga ggatggagcg 180
ggcgccgagg agtcgggaca gccccgtagc ttcacgcagc tcaacgacct gtccggggcc 240
gggggccggc aggggccggg gtcgacggaa aaggacccgg gcagcgcgga ctccgaggcg 300
gaggggctgc cgtacccggc gctagccccg gtggttttct tctacttgag ccaggacagc 360
cgcccgcgga gctggtgtct ccgcacggtc tgtaacccgt ggttcgagcg agtcagtatg 420
ctggtcattc ttctcaactg tgtgactctg ggtatgttca ggccgtgtga ggacattgcc 480
tgtgactccc agcgctgccg gatcctgcag gccttcgatg acttcatctt tgccttcttt 540
gctgtggaaa tggtggtgaa gatggtggcc ttgggcatct ttgggaagaa atgttacctg 600
ggagacactt ggaaccggct tgacttttc attgtcattg cagggatgct ggagtattcg 660
ctggacctgc agaacgtcag cttctccgca gtcaggacag tccgtgtgct gcgaccgctc 720
agggccatta accgggtgcc cagcatgcgc attctcgtca cattactgct ggacaccttg 780
cctatgctgg gcaacgtcct gctgctctgt ttcttcgtct ttttcatctt tggcatcgtg 840
ggcgtccagc tgtgggcagg actgcttcgc aaccgatgct tcctccccga gaacttcagc 900
ctccccctga gcgtggacct ggagccttat taccagacag agaatgagga cgagagcccc 960

ttcatctgct ctcagcctcg ggagaatggc atgagatcct gcaggagtgt gcccacactg 1020
cgtggggaag gcggtggtgg cccaccctgc agtctggact atgagaccta taacagttcc 1080
agcaacacca cctgtgtcaa ctggaaccag tactatacca actgctctgc gggcgagcac 1140
aacccccttca aaggcgccat caactttgac aacattggct atgcctggat cgccatcttc 1200
caggtcatca cactggaggg ctgggtcgac atcatgtact tcgtaatgga cgctcactcc 1260
ttctacaact tcatctactt cattcttctc atcatcgtgg gctccttctt catgatcaac 1320
ctgtgcctgg tggtgattgc cacgcagttc tccgagacca aacagcggga gagtcagctg 1380
atgcgggagc agcgtgtacg attcctgtcc aatgctagca ccctggcaag cttctctgag 1440
ccaggcagct gctatgagga gctactcaag tacctggtgt acatcctccg aaaagcagcc 1500
cgaaggctgg cccaggtctc tagggctata ggcgtgcggg ctgggctgct cagcagccca 1560
gtggcccgta gtgggcagga gccccagccc agtggcagct gcactcgctc acaccgtcgt 1620
ctgtctgtcc accacctggt ccaccaccat caccaccacc atcaccacta ccacctgggt 1680
aatgggacgc tcagagttcc ccgggccagc ccagagatcc aggacaggga tgccaatggg 1740
tctcgccggc tcatgctacc accaccctct acacccactc cctctggggg ccctccgagg 1800
ggtgcggagt ctgtacacag cttctaccat gctgactgcc acttggagcc agtccgttgc 1860

caggcacccc ctcccagatg cccatcggag gcatctggta ggactgtggg tagtgggaag 1920
gtgtacccca ctgtgcatac cagccctcca ccagagatac tgaaggataa agcactagtg 1980
gaggtggccc ccagccctgg gccccccacc ctcaccagct tcaacatccc acctgggccc 2040
ttcagctcca tgcacaagct cctggagaca cagagtacgg gagcctgcca tagctcctgc 2100
aaaatctcca gcccttgctc caaggcagac agtggagcct gcgggccgga cagttgtccc 2160
tactgtgccc ggacaggagc aggagagcca gagtccgctg accatgtcat gcctgactca 2220
gacagcgagg ctgtgtatga gttcacacag gacgctcagc acagtgacct ccgggatccc 2280
cacagccggc ggcgacagcg gagcctgggc ccagatgcag agcctagttc tgtgctggct 2340
ttctggaggc tgatctgtga cacattccgg aagatcgtag atagcaaata ctttggccgg 2400
ggaatcatga tcgccatcct ggtcaataca ctcagcatgg gcatcgagta ccacgagcag 2460
cccgaggagc tcaccaacgc cctggaaatc agcaacatcg tcttcaccag cctcttcgcc 2520
ttggagatgc tgctgaaact gcttgtctac ggtccctttg gctacattaa gaatccctac 2580
aacatctttg atggtgtcat tgtggtcatc agtgtgtggg agattgtggg ccagcaggga 2640
ggtggcctgt cggtgctgcg gaccttccgc ctgatgcggg tgctgaagct ggtgcgcttc 2700
ctgccggccc tgcagcgcca gctcgtggtg ctcatgaaga ccatggacaa cgtggccacc 2760
ttctgcatgc tcctcatgct gttcatcttc atcttcagca tcctgggcat gcatctcttt 2820
ggttgcaagt tcgcatctga acgggatggg gacacgttgc cagaccggaa gaatttcgac 2880
tccctgctct gggccatcgt cactgtcttt cagattctga ctcaggaaga ctggaataaa 2940
gtcctctaca acggcatggc ctccacatcg tcttgggctg ctctttactt catcgccctc 3000
atgacttttg gcaactatgt gctctttaac ctgctggtgg ccattcttgt ggaaggattc 3060

caggcagagg aaatcggcaa acgggaagat gcgagtggac agttaagctg tattcagctg 3120
cctgtcaact ctcaggggggg agatgccacc aagtctgagt cagagcctga tttcttttcg 3180
cccagtgtgg atggtgatgg ggacagaaag aagcgcttgg ccctggtggc tttgggagaa 3240
cacgcggaac tacgaaagag ccttttgcca cccctcatca tccatacggc tgcgacacca 3300
atgtcactac ccaagagctc cagcacaggt gtgggggaag cactgggctc tggctctcga 3360
cgtaccagta gcagtgggtc cgctgagcct ggagctgccc accatgagat gaaatctccg 3420
ccaagtgccc gcagctcccc gcacagtccc tggagtgcgg caagcagctg gaccagcagg 3480
cgctccagca ggaacagcct gggccgggcc cccagcctaa agcggaggag cccgagcggg 3540
gagcggaggt ccctgctgtc tggagagggc caggagagtc aggatgagga ggaaagttca 3600
gaagaggacc gggccagccc agcaggcagt gaccatcgcc acaggggttc cttggaacgt 3660
gaggccaaga gttcctttga cctgcctgac actctgcagg tgccggggct gcaccgcaca 3720
gccagcggcc ggagctctgc ctctgagcac caagactgta atggcaagtc ggcttcaggg 3780
cgtttggccc gcaccctgag gactgatgac ccccaactgg atggggatga tgacaatgat 3840

gagggaaatc tgagcaaagg ggaacgcata caagcctggg tcagatcccg gcttcctgcc 3900
tgttgccgag agcgagattc ctggtcggcc tatatctttc ctcctcagtc aaggtttcgt 3960
ctcctgtgtc accggatcat cacccacaag atgtttgacc atgtggtcct cgtcatcatc 4020
ttcctcaact gtatcaccat cgctatggag cgccccaaaa ttgacccccа cagcgctgag 4080
cgcatcttcc tgaccctctc caactacatc ttcacggcag tctttctagc tgaaatgaca 4140
gtgaaggtgg tggcactggg ctggtgcttt ggggagcagg cctacctgcg cagcagctgg 4200
aatgtgctgg acggcttgct ggtgctcatc tccgtcatcg acatcctggt ctccatggtc 4260
tccgacagcg gcaccaagat ccttggcatg ctgagggtgc tgcggctgct gcggaccctg 4320
cgtccactca gggtcatcag ccgggcccag ggactgaagc tggtggtaga gactctgatg 4380
tcatccctca aacccattgg caacattgtg gtcatttgct gtgccttctt catcattttt 4440
ggaattctcg gggtgcagct cttcaaaggg aagttcttcg tgtgtcaggg tgaggacacc 4500
aggaacatca ctaacaaatc cgactgcgct gaggccagct accgatgggt ccggcacaag 4560
tacaactttg acaacctggg ccaggctctg atgtccctgt ttgtgctggc ctccaaggat 4620
ggttgggttg acatcatgta tgatgggctg gatgctgtgg gtgtggatca gcagcccatc 4680
atgaaccaca acccctggat gctgctatac ttcatctcct tcctcctcat cgtggccttc 4740
tttgtcctga acatgtttgt gggcgtggtg gtggagaact tccataagtg cagacagcac 4800
caggaggagg aggaggcgag gcggcgtgag gagaagcgac tacggaggct ggagaaaaag 4860
agaaggaatc taatgttgga cgatgtaatt gcttccggca gctcagccag cgctgcgtca 4920
gaagcccagt gcaagcccta ctactctgac tactcgagat tccggctcct tgtccaccac 4980
ctgtgtacca gccactacct ggacctcttc atcactggtg tcatcgggct gaacgtggtc 5040
actatggcca tggaacatta ccagcagccc cagatcctgg acgaggctct gaagatctgc 5100
aattacatct ttaccgtcat ctttgtcttt gagtcagttt tcaaacttgt ggcctttggc 5160
ttccgccgtt tcttccagga caggtggaac cagctggacc tggctattgt gcttctgtcc 5220
atcatgggca tcacactgga ggagattgag gtcaatgctt cgctgcccat caaccccacc 5280
atcatccgta tcatgagggt gctccgcatt gctcgagttc tgaagctgtt gaagatggct 5340
gtgggcatgc gggcactgct ggacacggtg atgcaggccc tgccccaggt ggggaacctg 5400
ggacttctct tcatgttatt gtttttcatc tttgcagctc tgggcgtgga gctctttgga 5460
gacctggagt gtgatgagac acacccttgt gagggcttgg gtcggcatgc cacctttagg 5520
aactttggta tggcctttct gaccctcttc cgagtctcca ctggtgacaa ctggaatggt 5580
attatgaagg acaccctccg ggactgtgac caggagtcca cctgctacaa cactgtcatc 5640
tcccctatct actttgtgtc cttcgtgctg acggcccagt ttgtgctggt caacgtggtc 5700
atagctgtgc tgatgaagca cctggaagaa agcaacaaag aggccaagga ggaggccgag 5760
ctcgaggccg agctggagct ggagatgaag acgctcagcc cgcagcccca ctccccgctg 5820
ggcagcccct tcctctggcc cggggtggag ggtgtcaaca gtcctgacag ccctaagcct 5880
ggggctccac acaccactgc ccacattgga gcagcctcgg gcttctccct tgagcacccc 5940
acgatggtac cccaccccga ggaggtgcca gtccccctag gaccagacct gctgactgtg 6000
aggaagtctg gtgtcagccg gacgcactct ctgcccaatg acagctacat gtgccgcaat 6060
gggagcactg ctgagagatc cctaggacac aggggctggg ggctccccaa agcccagtca 6120
ggctccatct tgtccgttca ctcccaacca gcagacacca gctgcatcct acagcttccc 6180
aaagatgtgc actatctgct ccagcctcat ggggccccca cctggggcgc catccctaaa 6240
ctacccccac ctggccgctc ccctctggct cagaggcctc tcaggcgcca ggcagcaata 6300
aggactgact ccctggatgt gcagggcctg ggtagccggg aagacctgtt gtcagaggtg 6360
agtgggccct cctgccctct gacccggtcc tcatccttct ggggcgggtc gagcatccag 6420
gtgcagcagc gttccggcat ccagagcaaa gtctccaagc acatccgcct gccagcccct 6480
tgcccaggcc tggaacccag ctgggccaag gaccctccag agaccagaag cagcttagag 6540
ctggacacgg agctgagctg gatttcagga gacctccttc ccagcagcca ggaagaaccc 6600
ctgtccccac gggacctgaa gaagtgctac agtgtagaga cccagagctg caggcgcagg 6660
cctgggtcct ggctagatga acagcggaga cactccattg ctgtcagctg tctggacagc 6720

ggctcccaac cccgcctatg tccaagcccc tcaagcctcg ggggccaacc tcttgggggt 6780
cctgggagcc ggcctaagaa aaaactcagc ccacccagta tctctataga ccccccggag 6840
agccagggct ctcggccccc atgcagtcct ggtgtctgcc tcaggaggag ggcgccggcc 6900
agtgactcta aggatccctc ggtctccagc ccccttgaca gcacggctgc ctcaccctcc 6960
ccaaagaaag acacgctgag tctctctggt ttgtcttctg acccaacaga catggacccc 7020
tgagtcctac ccactctccc ccatcacctt tctccaccgg gtgcagatcc tagctccgcc 7080
tcctgggcag cgtttctgaa aagtcccacg taagcagcaa gcagccacga ggcacctcac 7140
ctgccttctt cagtggctgg tggggatgac gagcagaact tccggagagt cgatctgaag 7200
agaacacagc cctggagccc ctgcctccgg gaagaaggaa aaggagaaag cccagtgtgg 7260
ccaaggctcc cgacaccagg agctg 7285

<210> 4
<211> 2425
<212> PRT
<213> Rattus sp.

<400> 4

Glu Leu Ser Thr Gly Pro Pro Gly Asp Ser Ala Ser Ser Leu Glu Pro
1 5 10 15

Pro Thr Cys Ser Pro Thr Gly Val Pro Arg Leu Arg Glu Asp Thr Ser
20 25 30

Ser Glu Gly Leu Arg Ser Pro Leu Phe Gly Pro Pro Gly Ala Pro Ala
35 40 45

Gly Gln Arg Met Asp Glu Glu Glu Asp Gly Ala Gly Ala Glu Glu Ser
50 55 60

Gly Gln Pro Arg Ser Phe Thr Gln Leu Asn Asp Leu Ser Gly Ala Gly
65 70 75 80

Gly Arg Gln Gly Pro Gly Ser Thr Glu Lys Asp Pro Gly Ser Ala Asp
85 90 95

Ser Glu Ala Glu Gly Leu Pro Tyr Pro Ala Leu Ala Pro Val Val Phe
100 105 110

Phe Tyr Leu Ser Gln Asp Ser Arg Pro Arg Ser Trp Cys Leu Arg Thr
115 120 125

Val Cys Asn Pro Trp Phe Glu Arg Val Ser Met Leu Val Ile Leu Leu
130 135 140

Asn Cys Val Thr Leu Gly Met Phe Arg Pro Cys Glu Asp Ile Ala Cys
145 150 155 160

Asp Ser Gln Arg Cys Arg Ile Leu Gln Ala Phe Asp Asp Phe Ile Phe
165 170 175

Ala Phe Phe Ala Val Glu Met Val Val Lys Met Val Ala Leu Gly Ile
180 185 190

Phe Gly Lys Lys Cys Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe
195 200 205

Phe Ile Val Ile Ala Gly Met Leu Glu Tyr Ser Leu Asp Leu Gln Asn
210 215 220

Val Ser Phe Ser Ala Val Arg Thr Val Arg Val Leu Arg Pro Leu Arg
225 230 235 240

Ala Ile Asn Arg Val Pro Ser Met Arg Ile Leu Val Thr Leu Leu Leu
245 250 255

Asp Thr Leu Pro Met Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val
260 265 270

Phe Phe Ile Phe Gly Ile Val Gly Val Gln Leu Trp Ala Gly Leu Leu
275 280 285

Arg Asn Arg Cys Phe Leu Pro Glu Asn Phe Ser Leu Pro Leu Ser Val
290 295 300

Asp Leu Glu Pro Tyr Tyr Gln Thr Glu Asn Glu Asp Glu Ser Pro Phe
305 310 315 320

Ile Cys Ser Gln Pro Arg Glu Asn Gly Met Arg Ser Cys Arg Ser Val
325 330 335

Pro Thr Leu Arg Gly Glu Gly Gly Gly Gly Pro Pro Cys Ser Leu Asp
340 345 350

Tyr Glu Thr Tyr Asn Ser Ser Ser Asn Thr Thr Cys Val Asn Trp Asn
355 360 365

Gln Tyr Tyr Thr Asn Cys Ser Ala Gly Glu His Asn Pro Phe Lys Gly
370 375 380

Ala Ile Asn Phe Asp Asn Ile Gly Tyr Ala Trp Ile Ala Ile Phe Gln
385 390 395 400

Val Ile Thr Leu Glu Gly Trp Val Asp Ile Met Tyr Phe Val Met Asp
405 410 415

Ala His Ser Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile Val
420 425 430

Gly Ser Phe Phe Met Ile Asn Leu Cys Leu Val Val Ile Ala Thr Gln
435 440 445

Phe Ser Glu Thr Lys Gln Arg Glu Ser Gln Leu Met Arg Glu Gln Arg
450 455 460

Val Arg Phe Leu Ser Asn Ala Ser Thr Leu Ala Ser Phe Ser Glu Pro
465 470 475 480

Gly Ser Cys Tyr Glu Glu Leu Leu Lys Tyr Leu Val Tyr Ile Leu Arg
485 490 495

Lys Ala Ala Arg Arg Leu Ala Gln Val Ser Arg Ala Ile Gly Val Arg
500 505 510

Ala Gly Leu Leu Ser Ser Pro Val Ala Arg Ser Gly Gln Glu Pro Gln
515 520 525

Pro Ser Gly Ser Cys Thr Arg Ser His Arg Arg Leu Ser Val His His
530 535 540

Leu Val His His His His His His His His His Tyr His Leu Gly Asn
545 550 555 560

Gly Thr Leu Arg Val Pro Arg Ala Ser Pro Glu Ile Gln Asp Arg Asp
565 570 575

Ala Asn Gly Ser Arg Arg Leu Met Leu Pro Pro Pro Ser Thr Pro Thr
580 585 590

Pro Ser Gly Gly Pro Pro Arg Gly Ala Glu Ser Val His Ser Phe Tyr
595 600 605

His Ala Asp Cys His Leu Glu Pro Val Arg Cys Gln Ala Pro Pro Pro
610 615 620

Arg Cys Pro Ser Glu Ala Ser Gly Arg Thr Val Gly Ser Gly Lys Val
625 630 635 640

Tyr Pro Thr Val His Thr Ser Pro Pro Pro Glu Ile Leu Lys Asp Lys
645 650 655

Ala Leu Val Glu Val Ala Pro Ser Pro Gly Pro Pro Thr Leu Thr Ser
660 665 670

Phe Asn Ile Pro Pro Gly Pro Phe Ser Ser Met His Lys Leu Leu Glu
675 680 685

Thr Gln Ser Thr Gly Ala Cys His Ser Ser Cys Lys Ile Ser Ser Pro
690 695 700

Cys Ser Lys Ala Asp Ser Gly Ala Cys Gly Pro Asp Ser Cys Pro Tyr
705 710 715 720

Cys Ala Arg Thr Gly Ala Gly Glu Pro Glu Ser Ala Asp His Val Met
725 730 735

Pro Asp Ser Asp Ser Glu Ala Val Tyr Glu Phe Thr Gln Asp Ala Gln
740 745 750

His Ser Asp Leu Arg Asp Pro His Ser Arg Arg Arg Gln Arg Ser Leu
755 760 765

Gly Pro Asp Ala Glu Pro Ser Ser Val Leu Ala Phe Trp Arg Leu Ile
770 775 780

Cys Asp Thr Phe Arg Lys Ile Val Asp Ser Lys Tyr Phe Gly Arg Gly
785 790 795 800

Ile Met Ile Ala Ile Leu Val Asn Thr Leu Ser Met Gly Ile Glu Tyr
805 810 815

His Glu Gln Pro Glu Glu Leu Thr Asn Ala Leu Glu Ile Ser Asn Ile
820 825 830

Val Phe Thr Ser Leu Phe Ala Leu Glu Met Leu Leu Lys Leu Leu Val
835 840 845

Tyr Gly Pro Phe Gly Tyr Ile Lys Asn Pro Tyr Asn Ile Phe Asp Gly
850 855 860

Val Ile Val Val Ile Ser Val Trp Glu Ile Val Gly Gln Gln Gly Gly
865 870 875 880

Gly Leu Ser Val Leu Arg Thr Phe Arg Leu Met Arg Val Leu Lys Leu
885 890 895

Val Arg Phe Leu Pro Ala Leu Gln Arg Gln Leu Val Val Leu Met Lys
900 905 910

Thr Met Asp Asn Val Ala Thr Phe Cys Met Leu Leu Met Leu Phe Ile
915 920 925

Phe Ile Phe Ser Ile Leu Gly Met His Leu Phe Gly Cys Lys Phe Ala
930 935 940

Ser Glu Arg Asp Gly Asp Thr Leu Pro Asp Arg Lys Asn Phe Asp Ser
945 950 955 960

Leu Leu Trp Ala Ile Val Thr Val Phe Gln Ile Leu Thr Gln Glu Asp
965 970 975

Trp Asn Lys Val Leu Tyr Asn Gly Met Ala Ser Thr Ser Ser Trp Ala
980 985 990

Ala Leu Tyr Phe Ile Ala Leu Met Thr Phe Gly Asn Tyr Val Leu Phe
995 1000 1005

Asn Leu Leu Val Ala Ile Leu Val Glu Gly Phe Gln Ala Glu Glu Ile
1010 1015 1020

Gly Lys Arg Glu Asp Ala Ser Gly Gln Leu Ser Cys Ile Gln Leu Pro
1025 1030 1035 1040

Val Asn Ser Gln Gly Gly Asp Ala Thr Lys Ser Glu Ser Glu Pro Asp
1045 1050 1055

Phe Phe Ser Pro Ser Val Asp Gly Asp Gly Asp Arg Lys Lys Arg Leu
1060 1065 1070

Ala Leu Val Ala Leu Gly Glu His Ala Glu Leu Arg Lys Ser Leu Leu
1075 1080 1085

Pro Pro Leu Ile Ile His Thr Ala Ala Thr Pro Met Ser Leu Pro Lys
1090 1095 1100

Ser Ser Ser Thr Gly Val Gly Glu Ala Leu Gly Ser Gly Ser Arg Arg
1105 1110 1115 1120

Thr Ser Ser Ser Gly Ser Ala Glu Pro Gly Ala Ala His His Glu Met
1125 1130 1135

Lys Ser Pro Pro Ser Ala Arg Ser Ser Pro His Ser Pro Trp Ser Ala
1140 1145 1150

Ala Ser Ser Trp Thr Ser Arg Arg Ser Ser Arg Asn Ser Leu Gly Arg
1155 1160 1165

Ala Pro Ser Leu Lys Arg Arg Ser Pro Ser Gly Glu Arg Arg Ser Leu
1170 1175 1180

Leu Ser Gly Glu Gly Gln Glu Ser Gln Asp Glu Glu Glu Ser Ser Glu
1185 1190 1195 1200

Glu Asp Arg Ala Ser Pro Ala Gly Ser Asp His Arg His Arg Gly Ser
1205 1210 1215

Leu Glu Arg Glu Ala Lys Ser Ser Phe Asp Leu Pro Asp Thr Leu Gln
1220 1225 1230

Val Pro Gly Leu His Arg Thr Ala Ser Gly Arg Ser Ser Ala Ser Glu
1235 1240 1245

His Gln Asp Cys Asn Gly Lys Ser Ala Ser Gly Arg Leu Ala Arg Thr
1250 1255 1260

Leu Arg Thr Asp Asp Pro Gln Leu Asp Gly Asp Asp Asp Asn Asp Glu
1265 1270 1275 1280

Gly Asn Leu Ser Lys Gly Glu Arg Ile Gln Ala Trp Val Arg Ser Arg
1285 1290 1295

Leu Pro Ala Cys Cys Arg Glu Arg Asp Ser Trp Ser Ala Tyr Ile Phe
1300 1305 1310

Pro Pro Gln Ser Arg Phe Arg Leu Leu Cys His Arg Ile Ile Thr His
1315 1320 1325

Lys Met Phe Asp His Val Val Leu Val Ile Ile Phe Leu Asn Cys Ile
1330 1335 1340

Thr Ile Ala Met Glu Arg Pro Lys Ile Asp Pro His Ser Ala Glu Arg
1345 1350 1355 1360

Ile Phe Leu Thr Leu Ser Asn Tyr Ile Phe Thr Ala Val Phe Leu Ala
1365 1370 1375

Glu Met Thr Val Lys Val Val Ala Leu Gly Trp Cys Phe Gly Glu Gln
1380 1385 1390

Ala Tyr Leu Arg Ser Ser Trp Asn Val Leu Asp Gly Leu Leu Val Leu
1395 1400 1405

Ile Ser Val Ile Asp Ile Leu Val Ser Met Val Ser Asp Ser Gly Thr
1410 1415 1420

Lys Ile Leu Gly Met Leu Arg Val Leu Arg Leu Leu Arg Thr Leu Arg
1425 1430 1435 1440

Pro Leu Arg Val Ile Ser Arg Ala Gln Gly Leu Lys Leu Val Val Glu
1445 1450 1455

Thr Leu Met Ser Ser Leu Lys Pro Ile Gly Asn Ile Val Val Ile Cys
1460 1465 1470

Cys Ala Phe Phe Ile Ile Phe Gly Ile Leu Gly Val Gln Leu Phe Lys
1475 1480 1485

Gly Lys Phe Phe Val Cys Gln Gly Glu Asp Thr Arg Asn Ile Thr Asn
1490 1495 1500

Lys Ser Asp Cys Ala Glu Ala Ser Tyr Arg Trp Val Arg His Lys Tyr
1505 1510 1515 1520

Asn Phe Asp Asn Leu Gly Gln Ala Leu Met Ser Leu Phe Val Leu Ala
1525 1530 1535

Ser Lys Asp Gly Trp Val Asp Ile Met Tyr Asp Gly Leu Asp Ala Val
1540 1545 1550

Gly Val Asp Gln Gln Pro Ile Met Asn His Asn Pro Trp Met Leu Leu
1555 1560 1565

Tyr Phe Ile Ser Phe Leu Leu Ile Val Ala Phe Phe Val Leu Asn Met
1570 1575 1580

Phe Val Gly Val Val Val Glu Asn Phe His Lys Cys Arg Gln His Gln
1585 1590 1595 1600

Glu Glu Glu Glu Ala Arg Arg Arg Glu Glu Lys Arg Leu Arg Arg Leu
1605 1610 1615

Glu Lys Lys Arg Arg Asn Leu Met Leu Asp Asp Val Ile Ala Ser Gly
1620 1625 1630

Ser Ser Ala Ser Ala Ala Ser Glu Ala Gln Cys Lys Pro Tyr Tyr Ser
1635 1640 1645

Asp Tyr Ser Arg Phe Arg Leu Leu Val His His Leu Cys Thr Ser His
1650 1655 1660

Tyr Leu Asp Leu Phe Ile Thr Gly Val Ile Gly Leu Asn Val Val Thr
1665 1670 1675 1680

Met Ala Met Glu His Tyr Gln Gln Pro Gln Ile Leu Asp Glu Ala Leu
1685 1690 1695

Lys Ile Cys Asn Tyr Ile Phe Thr Val Ile Phe Val Phe Glu Ser Val
1700 1705 1710

Phe Lys Leu Val Ala Phe Gly Phe Arg Arg Phe Phe Gln Asp Arg Trp
1715 1720 1725

Asn Gln Leu Asp Leu Ala Ile Val Leu Leu Ser Ile Met Gly Ile Thr
1730 1735 1740

Leu Glu Glu Ile Glu Val Asn Ala Ser Leu Pro Ile Asn Pro Thr Ile
1745 1750 1755 1760

Ile Arg Ile Met Arg Val Leu Arg Ile Ala Arg Val Leu Lys Leu Leu
1765 1770 1775

Lys Met Ala Val Gly Met Arg Ala Leu Leu Asp Thr Val Met Gln Ala
1780 1785 1790

Leu Pro Gln Val Gly Asn Leu Gly Leu Leu Phe Met Leu Leu Phe Phe
1795 1800 1805

Ile Phe Ala Ala Leu Gly Val Glu Leu Phe Gly Asp Leu Glu Cys Asp
1810 1815 1820

Glu Thr His Pro Cys Glu Gly Leu Gly Arg His Ala Thr Phe Arg Asn
1825 1830 1835 1840

Phe Gly Met Ala Phe Leu Thr Leu Phe Arg Val Ser Thr Gly Asp Asn
1845 1850 1855

Trp Asn Gly Ile Met Lys Asp Thr Leu Arg Asp Cys Asp Gln Glu Ser
1860 1865 1870

Thr Cys Tyr Asn Thr Val Ile Ser Pro Ile Tyr Phe Val Ser Phe Val
1875 1880 1885

Leu Thr Ala Gln Phe Val Leu Val Asn Val Val Ile Ala Val Leu Met
1890 1895 1900

Lys His Leu Glu Glu Ser Asn Lys Glu Ala Lys Glu Glu Ala Glu Leu
1905 1910 1915 1920

Glu Ala Glu Leu Glu Leu Glu Met Lys Thr Leu Ser Pro Gln Pro His
1925 1930 1935

Ser Pro Leu Gly Ser Pro Phe Leu Trp Pro Gly Val Glu Gly Val Asn
1940 1945 1950

Ser Pro Asp Ser Pro Lys Pro Gly Ala Pro His Thr Thr Ala His Ile
1955 1960 1965

Gly Ala Ala Ser Gly Phe Ser Leu Glu His Pro Thr Met Val Pro His
1970 1975 1980

Pro Glu Glu Val Pro Val Pro Leu Gly Pro Asp Leu Leu Thr Val Arg
1985 1990 1995 2000

Lys Ser Gly Val Ser Arg Thr His Ser Leu Pro Asn Asp Ser Tyr Met
2005 2010 2015

Cys Arg Asn Gly Ser Thr Ala Glu Arg Ser Leu Gly His Arg Gly Trp
2020 2025 2030

Gly Leu Pro Lys Ala Gln Ser Gly Ser Ile Leu Ser Val His Ser Gln
2035 2040 2045

Pro Ala Asp Thr Ser Cys Ile Leu Gln Leu Pro Lys Asp Val His Tyr
2050 2055 2060

Leu Leu Gln Pro His Gly Ala Pro Thr Trp Gly Ala Ile Pro Lys Leu
2065 2070 2075 2080

Pro Pro Pro Gly Arg Ser Pro Leu Ala Gln Arg Pro Leu Arg Arg Gln
2085 2090 2095

Ala Ala Ile Arg Thr Asp Ser Leu Asp Val Gln Gly Leu Gly Ser Arg
2100 2105 2110

Glu Asp Leu Leu Ser Glu Val Ser Gly Pro Ser Cys Pro Leu Thr Arg
2115 2120 2125

Ser Ser Ser Phe Trp Gly Gly Ser Ser Ile Gln Val Gln Gln Arg Ser
2130 2135 2140

Gly Ile Gln Ser Lys Val Ser Lys His Ile Arg Leu Pro Ala Pro Cys
2145 2150 2155 2160

Pro Gly Leu Glu Pro Ser Trp Ala Lys Asp Pro Pro Glu Thr Arg Ser
2165 2170 2175

Ser Leu Glu Leu Asp Thr Glu Leu Ser Trp Ile Ser Gly Asp Leu Leu
2180 2185 2190

Pro Ser Ser Gln Glu Glu Pro Leu Ser Pro Arg Asp Leu Lys Lys Cys
2195 2200 2205

Tyr Ser Val Glu Thr Gln Ser Cys Arg Arg Arg Pro Gly Ser Trp Leu
2210 2215 2220

Asp Glu Gln Arg Arg His Ser Ile Ala Val Ser Cys Leu Asp Ser Gly
2225 2230 2235 2240

Ser Gln Pro Arg Leu Cys Pro Ser Pro Ser Ser Leu Gly Gly Gln Pro
2245 2250 2255

Leu Gly Gly Pro Gly Ser Arg Pro Lys Lys Lys Leu Ser Pro Pro Ser
2260 2265 2270

Ile Ser Ile Asp Pro Pro Glu Ser Gln Gly Ser Arg Pro Pro Cys Ser
2275 2280 2285

Pro Gly Val Cys Leu Arg Arg Arg Ala Pro Ala Ser Asp Ser Lys Asp
2290 2295 2300

Pro Ser Val Ser Ser Pro Leu Asp Ser Thr Ala Ala Ser Pro Ser Pro
2305 2310 2315 2320

Lys Lys Asp Thr Leu Ser Leu Ser Gly Leu Ser Ser Asp Pro Thr Asp
2325 2330 2335

Met Asp Pro Val Leu Pro Thr Leu Pro His His Leu Ser Pro Pro Gly
2340 2345 2350

Ala Asp Pro Ser Ser Ala Ser Trp Ala Ala Phe Leu Lys Ser Pro Thr
2355 2360 2365

Ala Ala Ser Ser His Glu Ala Pro His Leu Pro Ser Ser Val Ala Gly
2370 2375 2380

Gly Asp Asp Glu Gln Asn Phe Arg Arg Val Asp Leu Lys Arg Thr Gln
2385 2390 2395 2400

Pro Trp Ser Pro Cys Leu Arg Glu Glu Gly Lys Gly Glu Ser Pro Val
2405 2410 2415

Trp Pro Arg Leu Pro Thr Pro Gly Ala
2420 2425

<210> 5
<211> 7
<212> PRT
<213> Rattus sp.

<400> 5
Ser Lys Glu Lys Gln Met Ala
1 5

<210> 6
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer Sequence

<400> 6
tngchatgga gmgnccy 17

<210> 7
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer Sequence

<400> 7
cttbcccttg aasarctg 18

<210> 8
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer Sequence

<400> 8
ccgctgtcgg agaccatgga gacc 24

<210> 9
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
Sequence

<400> 9
agcggcccaa aattgacccc cacag 25

<210> 10
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
Sequence

<400> 10
gaagatgcga gtggacag 18

<210> 11
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
Sequence

<400> 11
ctgtggcgat ggtcactg 18

<210> 12
<211> 205
<212> DNA
<213> Rattus sp.

<400> 12
atgctccccc accggggtcc cccggttgcg tgaggacacc tcctctgagg ggctccgctc 60
gcccctcttc ggacccccgg gggccccggc tggccagagg atggacgagg aggaggatgg 120
agcgggcgcc gaggagtcgg gacagccccg tagcttcacg cagctcaacg acctgtccgg 180
ggccgggggc cggcaggggc cgggg 205

<210> 13

<211> 206
<212> DNA
<213> Rattus sp.

<400> 13
atgctccccc accgggtccc ccgttgcgtg aggacacctc ctctgagggg ctccgctccg 60
ctcgcccctc ttcggacccc ccggggcccc ggctggccag aggatggacg aggaggagga 120
tggagcgggc gccgaggagt cgggacagcc ccgtagcttc acgcagctca acgacctgtc 180
cggggccggg ggcggcaggg gccggg 206

<210> 14
<211> 21
<212> DNA
<213> Rattus sp.

<400> 14
agtaaggaga agcagatggc c 21

<210> 15
<211> 9
<212> DNA
<213> Rattus sp.

<400> 15
ttggcttcc 9

<210> 16
<211> 54
<212> DNA
<213> Rattus sp.

<400> 16
aatctaatgt tggacgatgt aattgcttcc ggcagctcag ccagcgctgc gtca 54